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10/622,294	07/18/2003	David Chown	871-011416-US / 30020591	7249

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/622,294	CHOWN, DAVID	
	Examiner	Art Unit	
	Li Liu	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07/18/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawing is objected to because there is no description label for block "E" in Figure 5. This block needs to have descriptive label under 37 CFR 1.84(n) and 1.84(o). For example, "Integrated Electronics" may be used for the label of block "E".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ventrudo et al (US 5,589,684) in view of Nakanishi (US 6,374,021).

1) With regard to claim 1, Ventrudo et al disclose a system (Figure 1) for converting a first and a second signal representative of payload (11 in Figure 1, the diode laser is operable to transmit the payload signal) and supervisory (12 in Figure 1, the diode laser is operable to transmit the supervisory signal) information, respectively, between an electrical format and a WDM aggregated optical format, the system including:

at least one first converter (the diode laser 11 in Figure 1) for converting said first signal between said electrical format and a first, disaggregated optical format (column 4,

line 56-60, the diode laser is pumped by current injection, so it converts an electrical format to an optical format),

at least one second converter (the diode laser 12 in Figure 1) for converting said second signal between said electrical format and a second, disaggregated optical format (column 4, line 56-60, the diode laser is pumped by current injection, so it converts an electrical format to an optical format), and

at least one optical WDM converter (beam combiner/splitter 19 in Figure 1) for converting said first (17 in Figure 1) and second (18 in Figure 1) signals between said first and second disaggregated optical formats (17 and 18 are output from lasers) and said WDM aggregated optical format (20 in Figure 1),

Ventrudo et al disclose all of the subject matter as above, and no splices are used in the system. But, Ventrudo et al does not expressly teach that all components are integrated to a single self-contained module by means of signal propagation paths that are exempt from splices.

However, Nakanishi, in the same field of endeavor, discloses a single self-contained module (Figure 7, Figure 10, Figure 19) in which all optical components are installed on a printed circuit board (column 15, line 20-22) so that the system is capable to transmit optical signals with different wavelengths in a unidirection or bidirection manner. And the module has a simple structure, and is easy production, high reliability and low cost.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the compact module taught by Nakanishi to the

system of Ventrudo et al so that a lower loss, easy to implement and simpler structure transmitter can be obtained.

2) With regard to claim 2, Ventrudo et al disclose all of the subject matter as applied in claim 1 above, and Ventrudo et al also disclose that said first converter and said second converter have associated signal processing electronics (column 4, line 56-60, the diode laser is pumped by current injection).

3) With regard to claim 3, Ventrudo et al disclose all of the subject matter as applied in claim 1 above, and Ventrudo et al further disclose that said optical WDM converter includes a beam splitter (19 in Figure 1, column 5, line 12).

4) With regard to claim 4, Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claims 1 and 3 above. And Ventrudo et al further disclose that said beam splitter is arranged to transfer optical radiation (17 in Figure 1) between said first converter (11 in Figure 1) and optical fiber (23 in Figure 1).

But Ventrudo et al do not expressly disclose that said beam splitter has associated an optical connector.

However, Nakanishi, in the same field of endeavor, discloses a optical connector (152 in Figure 19, column 15 line 29) to get a better alignment between the lens and the fiber so to reduce the light loss (column 8, line 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical connector taught by Nakanishi to the system of Ventrudo et al so that a receptacle type of connector can be obtained, and the maintenance and replacement of fiber is made easier, and the WDM aggregated

optical format can be easily inputted into the fiber and loss due to the alignment is reduced.

5) With regard to claim 5, Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claims 1 and 3 above. And Ventrudo et al further disclose that said beam splitter is arranged to transfer optical radiation (18 in Figure 1) between said second converter (12 in Figure 1) and optical fiber (23 in Figure 1).

But Ventrudo et al does not expressly disclose that said beam splitter has associated an optical connector.

However, Nakanishi, in the same field of endeavor, discloses an optical connector (152 in Figure 19, column 15 line 29) to get a better alignment between the lens and the fiber so to reduce the light loss (column 8, line 13-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical connector taught by Nakanishi to the system of Ventrudo et al so that a receptacle type of connector can be obtained, and the maintenance and replacement of fiber is made easier, and the WDM aggregated optical format can be easily inputted into the fiber and loss due to the alignment is reduced.

6) With regard to claim 6, Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claims 1 and 3 above. And Ventrudo et al further disclose that said beam splitter has associated radiation focusing elements (lens 15 and 16 in Figure 1) interposed between said beam splitter and said first and said second converter.

7) With regard to claim 7, Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claims 1, 3 and 4 above. And Ventrudo et al further disclose that it includes a further focusing element (21 in Figure 1) interposed between said beam splitter and said optical connector for focusing onto said optical connector optical radiation propagating from said beam splitter.

8) With regard to claim 9, Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claim 1. And Ventrudo et al further disclose that said first converter and said second converter include laser sources (diode lasers 11 and 12 in Figure 1) driven with said first and second signals in said electrical format (column 4 line 57-60), respectively, and in that said optical WDM converter includes a WDM combiner (19 in Figure 1) to combine said first and said second signals in said first disaggregated optical format (17 in Figure 1) and said second disaggregated optical format (18 in Figure 1) to produce said WDM aggregated optical format (20 in Figure 1), the system thus comprising a transmitter.

But, Ventrudo et al, does not expressly teach that the system comprises a transmitter **module**.

However, Nakanishi, in the same field of endeavor, discloses a transmitter module (Figure 10, Figure 19) in which signal processing electronics and optical components are installed on a printed circuit board (column 15, line 20-22) so that the system is capable to transmit optical signals with different wavelengths in a unidirection or bidirection manner. And the module has a simple structure, and is easy production, high reliability and low cost.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the compact module taught by Nakanishi to the system of Ventrudo et al so that a lower loss, easy to implement and simpler structure transmitter can be obtained.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ventrudo et al (US 5,589,684) and Nakanishi (US 6,374,021) as applied in claims 1, 3, 4 and 7 above, and in further view of Calvani et al (US 5,329,394).

Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claims 1, 3, 4 and 7 above. But Ventrudo et al and Nakanishi fail to disclose that it includes an optical isolator interposed between said beam splitter and said further focusing element.

However, Calvani et al, in the same field of endeavor, teach an optical isolator (9, 209 and 210 in Figure 2) prevent the rays reflected by the mirror or the plate et al from re-entering lasers (column 4 line 33-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical isolator taught by Nakanishi to the system of Ventrudo et al and Nakanishi so that the rays reflected by the lens (21 in Figure 1) or fiber end (23 in Figure 1) can be isolated, the interference to the diode lasers can be avoided, and then the signal quality can be improved.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ventrudo et al (US 5,589,684) and Nakanishi (US 6,374,021) as applied in claim 1 above, and in further view of Orino et al (US 5,627,669).

Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claim 1. But Ventrudo et al does not expressly disclose that the same system can be used as the receiver if the diode lasers are replaced by photodiodes.

However, Orino et al teach a system in that an optical WDM converter includes a WDM splitter (92 in Figure 22) for de-multiplexing the WDM aggregated optical format (inputted from 77 and 76 in Figure 22) into a first disaggregated optical format (to light receiving element 72 in Figure 22) and said second disaggregated optical format (to light receiving element 90 in Figure 22), and in that said first converter (light receiving element 72 in Figure 22) and said second converter (light receiving element 90 in Figure 22) include photoelectric converters for converting said first disaggregated optical format and said second disaggregated optical format into said first and second signals in said electrical format (column 11 line 12-18), the system thus comprising a receiver.

But, Orino et al, do not expressly teach that the receiver system comprises a receiver **module**.

However, Nakanishi discloses a transmitting/receiving module (Figure 10, Figure 19) in which signal processing electronics and optical components are installed on a printed circuit board (column 15, line 20-22) so that the system is capable to receive optical signals with different wavelengths. And the module has a simple structure, and is easy production, high reliability and low cost.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the device taught by Orino and the receiver module taught by Nakanishi to the system of Ventrudo et al so that a lower loss, easy to implement and simpler structure receiver can be obtained.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ventrudo et al (US 5,589,684) and Nakanishi (US 6,374,021) as applied in claim 1 above, and in further view of Bloom et al (US 5,710,652).

Ventrudo et al and Nakanishi disclose all of the subject matter as applied in claim 1. But Ventrudo et al in view of Nakanishi does not expressly disclose that the combination of the transmitter and receiver comprises a transceiver module.

Bloom et al, disclose a transceiver module that includes: A pair of said first converters (54 and 78 in Figure 4), in the form of a first laser source (54 in Figure 4) and a first photoelectric converter (78 in Figure 4), respectively;

a pair of said second converters (52 and 79 in Figure 4) in the form of a second laser source (52 in Figure 4) and a second photoelectric converter (79 in Figure 4), respectively; and

a pair of said optical WDM converters (56 and 76 in Figure 4), in the form of a WDM combiner (56 in Figure 4) and a WDM splitter (76 in Figure 4), respectively;

the arrangement being such that said first laser source and said second laser source are arranged for converting a first pair of first and second signals representative of payload and supervisory information signal (the signal lasers 52 and 54 are operable to transmit the payload and supervisory) and , respectively, from said electrical format

into a first pair of first disaggregated optical format (light from 52 in Figure 4) column 3 line 55-66) and second disaggregated optical format signals (light from 54 in Figure 4) and said WDM combiner (56 in Figure 4) is adapted to convert said first pair of first and second disaggregated optical format signals into a first WDM aggregated optical format signal (light toward λ/4 plate), and

said WDM splitter (76 in Figure 4) is adapted to convert a second WDM aggregated optical format signal (FROM DISTANT TRANSCEIVER) into a second pair of first (to 78 in Figure 4) and second (to 79 in Figure 4) disaggregated optical format signals, and said first photoelectric converter (78 in Figure 4) and said second photoelectric converter (79 in Figure 4) are adapted to convert said second pair of first and second disaggregated optical format signals into a second pair of first and second signals representative of payload and supervisory information in said electrical format (column 5 line 63), the system thus comprising a transceiver module (Figure 3).

Although Bloom et al's device is used for free space optical telecommunication, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the same device to the optical **fiber** communications if the two telescopes are replaced by two focus lens, such as the focus lens (21 in Figure 1) taught by Ventrudo et al. By combining the device of Bloom et al's with the system of Ventrudo et al and Nakanishi, a compact, lower loss, easy to implement and simpler structure transceiver can be obtained.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Fold et al (US 6,567,195) disclose an optical remote network interface cards (NICs) in which transmitter and receiver are contained in one module (Figure 3 and Figure 5).

Walt et al (US 6,285,807) disclose a fiber optical sensor in which a combination of lens, beam splitters etc forms a transceiver (Figure 12).

Chiu et al (US 6,869,231) disclose a transceiver including an optical bench.

Arnold et al (US 6,347,001) disclose a laser communication system having at least two communicating transceivers.

King et al (2001/0048799) a wdm optical communication system having a plurality of channel types.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 7:30 am - 5:00 pm, alternating Fri off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571)272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
August 4, 2006

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